CLAIMS:

1. A cleaning robot adapted to move in a swimming pool or the like in accordance with commands from a main controller therein, the robot when in use being free of any cables connected to an external power supply, and having a body unit with a battery power pack, adapted to move along the floor and/or walls of said pool, and a tail unit comprising a head portion adapted to float on the surface of a pool, and a tethering cable attached at least in use, to the body unit; said tethering cable being of sufficient length to allow the float of said head portion while the body unit is on the floor of the pool.

2. A cleaning robot according to Claim 1, wherein the head portion is adapted to submerge below the water surface upon encountering an obstacle.

3. A cleaning robot according to Claim 1 or 2, wherein the head portion is of a geometry which minimizes the likelihood of entanglement thereof with obstacles.

4. A cleaning robot according to Claim 1, 2 or 3, wherein said tail unit is adapted for lifting the body unit thereby from the pool.

5. A cleaning robot according to any one of the preceding claims, wherein the head portion comprises a float user interface, and is designed such that the float user interface is disposed at or near the surface of the pool, when the tail unit is in its working position.

6. A cleaning robot according to Claim 5, wherein said tail unit further comprises at least one counter-weight adapted to maintain, at least in use, said working position of the tail unit.

7. A cleaning robot according to Claim 5, wherein said tail unit further comprises a tail unit controller.

8. A cleaning robot according to Claim 7, wherein the tail unit controller is in communication with the main controller.

9. A cleaning robot according to Claim 5, wherein the float user interface is adapted to receive user input.

10.   A cleaning robot according to Claim 5, wherein the float user interface is adapted to receive communication from a wireless remote control unit.

11.   A cleaning robot according to Claim 5, wherein said tail unit further comprises at least one data presentation device.

5   12.   A cleaning robot according to Claim 5, wherein said tail unit further comprises a connector designed for charging batteries or battery in said battery power pack by an external charger.

13.   A cleaning robot according to any of the above claims, further comprising an external battery charger, which is connectable to the tail unit for

10   charging at least one battery in said battery power pack in the body unit of the robot.

14.   A cleaning robot according to Claim 13, wherein the charger is adapted to communicate with the tail unit via a cable, and wherein another cable is used for connecting the tail unit with said battery power pack.

15   15.   A cleaning robot according to Claim 14, wherein the charger comprises at least one charger-side data presentation units.

16.   A cleaning robot according to any one of the preceding claims, the robot having a memory adapted to store a certain orientation of the robot, said controller being adapted to provide the robot with a command to align its

20   orientation in accordance with the stored orientation.

17.   A cleaning robot according to Claim 16, wherein said orientation is defined by the robot's initial orientation.

18.   A cleaning robot according to Claim 17, further comprising a detector for detecting a wall when impacted by the robot, wherein the alignment of the

25   robot's orientation is performed after at least one wall detection.

19.   A cleaning robot according to Claim 18, wherein the controller is adapted to allow the robot to perform a straight lap and a subsequent stepped lap, each between two wall detections, both laps comprising said alignment, the stepped lap also including rotation of the robot through a predetermined angle

30   relative to its orientation during the straight lap, whereby the robot is adapted to

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move along two known mutually angled directions independently of the shape of the walls of the swimming pool.

20.   A cleaning robot according to Claim 19, wherein said predetermined angle is 90 degrees.

21.   A cleaning robot according to Claim 19, wherein said period constitutes a predetermined portion of the duration of the preceding straight lap, said portion being increased after a predetermined number of wall detections.

22.   A cleaning robot according to any one of claims 16 to 21, having a battery power pack adapted to provide the robot with a power necessary for cleaning a pool having a predetermined size.

23.   A cleaning robot according to any one of the preceding claims, wherein said controller is adapted to count wall detections, and wherein each time after the robot has performed a straight lap before two detections, it performs a stepped lap in which the robot rotates to a predetermined angle relative to its orientation during the straight lap, within a certain period of time after the last wall detection, said period constituting a predetermined portion of the duration of the preceding straight lap, said portion undergoing a change after a predetermined number of wall detections.

24.   A cleaning robot according to Claim 23, wherein the change is a decrease, relative to a previous value of the portion.

25.   A cleaning robot according to Claim 23, wherein the change is an increase relative to a previous value of the portion.

26.   A cleaning robot according to Claim 24 or 25, wherein said initial value is predetermined to be not less than 1/2 of the duration of the preceding straight step, when said change is a decrease, and less than 1/2 of said duration when said change is an increase.

27.   A cleaning robot according to any one of the preceding claims, the controller being adapted to cause the robot to move in the pool along only two scanning directions obtained by adjusting the orientation of the robot in a predetermined way relative to its reference orientation, said scanning directions

having a predetermined angle therebetween, independently of the swimming pool's shape.

28.   A cleaning robot according to Claim 27, wherein said predetermined angle is 90 degrees.

29.   A cleaning robot according to any of the above claims, wherein the robot is preprogrammed for performing a plurality of cleaning modes.

30.   A cleaning robot according to Claim 29, wherein one of said cleaning modes comprises scanning the floor surface of the pool, and ascending a sidewall at predetermined time intervals.

31.   A cleaning robot according to Claim 29, wherein one of said cleaning modes comprises scanning the floor surface of the pool with a decreased speed and an increased suction.

32.   A cleaning robot according to Claim 29, wherein one of said cleaning modes comprises the cleaning robot executing a cycle comprising ascending a sidewall to the waterline, cleaning the waterline for a predetermined amount of time in a first direction with relation to the pool, descending the sidewall to the floor, moving along the sidewall a predetermined distance in a second direction which is opposite the first direction, ascending the sidewall, and continuing cleaning in the first direction.

33.   A robot according to Claim 32, adapted to repeat said cycle a predetermined number of times, subsequent to which the robot is adapted to begin the cycle on a different wall of the swimming pool.

34.   A cleaning robot according to any one of the above claims, the robot being adapted to stop at a predetermined location when one or more requirements are met.

35.   A cleaning robot according to Claim 34, wherein the requirements are that a predetermined number of wall encounters occur after the battery voltage drops below a predetermined amount.

36.   A cleaning robot according to Claim 35, wherein the predetermined number of wall encounters is one.

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37.   A cleaning robot according to any one of the preceding claims, the robot further comprising an electro-mechanical drive means; said first controller being adapted to detect the current through the drive means, whereby when the current exceeds a threshold, the controller assumes a wall impact to have occurred.

5   38.   A cleaning robot as disclosed in Claim 37, wherein the threshold is determined by multiplying an average of the current passing through the drive means during one or more traversings of the pool floor by a constant.

39.   A method for operating a swimming pool by a cleaning robot according to any one of the preceding claims.

10 40.   A method of cleaning a swimming pool according to Claim 39, wherein said pool has at least two adjacent walls whose tangents form with each other an angle different from 90 degrees.

41.   A cleaning robot adapted to move in a swimming pool or the like, comprising a head portion, the head portion comprising a float user interface, and

15 being designed such that the float user interface is disposed at or near the surface of the pool, when in a working position.

42.   A cleaning robot having a controller and a memory adapted to store a certain orientation of the robot, said controller being adapted to provide the robot with a command to align its orientation in accordance with the stored orientation.

20 43.   A cleaning robot adapted to move in a swimming pool or the like, having a controller adapted to count wall detections, wherein each time after the robot has performed a straight lap between two detections, it performs a stepped lap, wherein the robot rotates to a predetermined angle relative to its orientation during the straight lap, within a certain period of time after the last wall

25 detection, said period constituting a predetermined portion of the duration of the preceding straight lap, said portion undergoing a change after a predetermined number of wall detections.

44.   A cleaning robot adapted to move in a swimming pool or the like, adapted to move in the pool along only two scanning directions obtained by

30 adjusting the orientation of the robot in a predetermined way relative to its

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reference orientation, said scanning directions having a predetermined angle therebetween, independently of the swimming pool's shape.

45.   A cleaning robot adapted to move in a swimming pool or the like, wherein the robot is preprogrammed for performing a plurality of cleaning modes, of which at least two are selected from a group comprising:

     (a)   the robot scanning the floor surface of the pool, and ascending a sidewall at predetermined time intervals;

     (b)   the robot having a decreased speed and an increased suction; and

     (c) the robot executing a cycle comprising ascending a sidewall to the waterline, cleaning the waterline for a predetermined amount of time in a first direction with relation to the pool, descending the sidewall to the floor, moving along the sidewall a predetermined distance in a second direction which is opposite the first direction, ascending the sidewall, and continuing cleaning in the first direction.

46.   A cleaning robot adapted to move in a swimming pool or the like, the robot being adapted to stop at a predetermined location when one or more predetermined requirements are met.

47.   A cleaning robot adapted to move in a swimming pool or the like, the robot comprising an electro-mechanical drive means; the robot being adapted to detect electrical current through the drive means, whereby when the current exceeds a threshold, the robot assumes a wall impact to have occurred.